

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

D. RemarksObjections to Drawings

Proposed amended drawings are included herein. The drawings have been amended to so
5 that FIGS. 6 and 7 include the legend "BACKGROUND ART."

Objections to the Specification

The rejection argues that all references to chemical elements must be capitalized. Applicant respectfully requests a citation for the basis of this objection (e.g., 35 U.S.C. 112, 10 second paragraph, etc.). Applicant believes identification of elements by words beginning with a lower case letter is not only readily understood by those skilled in the art, but is in fact the preferred convention.

The examiner attention is directed to the very references cited in this rejection, which do not capitalize such words. Only a few of the many examples are set forth below:

15

From Van Zant, Peter, Microchip Fabrication: A Practical Guide to Semiconductor Processing, McGraw-Hill, 2000, (hereinafter Van Zant):

20 ... have an oxygen atmosphere... (Page 181, Line 10)
... amorphous silicon, tungsten... (Page 181, Line 15)

From U.S. Patent No. 5,422,291 (Clementi et al.):

25 ... oxide-nitride-oxide... (Col. 3, Line4)
... layer of silicon nitride... (Col. 3, Line 21)
... the silicon nitride... (Col. 3, Lines 22)
... layer of silicon nitride... (Col. 3, Line 67)
... nitrogen atmosphere... (Col. 4, Lines 22-23)

30 Thus, the references cited by the rejection support Applicant's use of non-capitalized words, and argue against such terms being objectionable.



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Because this newly raised objection is presented in a final action, this objection is considered by Applicant to be a final decision, and thus reviewable by petition.

Rejections Under 35 U.S.C. §112, Second Paragraph,

5 Applicant has amended claim 1 to clarify the term "surface" referred to in the claim.

Rejection of Claims 1-3 and 6 Under 35 U.S.C. §102(b) based on Clementi et al.

The invention of amended claim 1 is directed to method of forming a plurality of semiconductor device layers. The method includes the steps of forming an oxide layer on an 10 exposed surface of an insulating layer by reacting hydrogen with oxygen on the exposed surface of the insulating layer deposited over a wafer. The method also includes forming a conductive gate layer over the oxide layer.

As is well known, a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single reference. Because the 15 reference *Clementi et al.* does not show all elements of claim 1, this ground of rejection is traversed.

Clementi et al. discloses a method of forming insulating layers between a floating gate and a control gate of a read-only-memory (ROM) in which a silicon nitride layer is oxidized to form a layer of silicon oxide. However, such a layer is not formed by reacting hydrogen with 20 oxygen, as recited in claim 1. In *Clementi et al.* the silicon nitride layer is oxidized in the presence of water vapor (and oxygen).¹ While it is admitted that a water molecule consists of two hydrogen atoms and an oxygen atom, such an arrangement does not react hydrogen with oxygen, as claimed.

Accordingly, because the cited reference does not show all limitations of claim 1, this 25 ground of rejection is traversed.

Rejection of Claims 4 and 5 Under 35 U.S.C. §102(b) based on Clementi et al. and "inherent" teachings of Van Zant.

To the extent that this rejection relies on *Clementi et al.*, the comments set forth above for 30 claim 1 are incorporated by reference herein.

¹ See *Clementi et al.*, Col. 4, Lines 25-31 and Col. 5, Lines 31-35.



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Claim 4, which depends from claim 1, recites that a reacting of hydrogen with oxygen has a duration in the range of 30 seconds to 2 minutes. Claim 5 recites the reaction time is approximately 1 minute. In sharp contrast, *Clementi et al.* teaches a oxidation step that is 60-240 times longer:

5

Oxidation in steam and oxygen at 950°C is protracted for 2 hrs. causing the growth of a 10 nm thick SiO₂ layer.²

10 Thus, the reference clearly does not show Applicant's brief reaction time, but teaches away from such a limitation by employing a "protracted" oxidation.

To show Applicant's brief reaction time, the rejection relies on the teachings of a different reference. The entire reasoning is set forth below:

15 The method of Van Zant teaches wet oxidation and Rapid Thermal Oxidation ("RTO"), which is inherently teaching the reaction time because the thickness and temperature of the RTO are inherent to oxidation in order to control the thickness of the oxide layer (see Van Zant: fig. 7.28; pg. 181, lines 2-12).

It is noted that rapid thermal oxidation (RTO) is not shown or suggested by *Clementi et al.*, as 20 the reference clearly teaches away from such a limitation by showing a protracted oxidation. Accordingly, this is not a proper anticipation rejection. The rejection cannot argue that a claim is anticipated by a first reference (*Clementi et al.*) by arguing that a limitation is inherent in a second, different reference (*Van Zant*).

Modifying *Clementi et al.* in view of *Van Zant* is a de facto obviousness rejection. 25 However, such a rejection cannot rise to the level of a prima facie case, as the requisite motivation for the modification has not been shown.

In addition or alternatively, the reliance on *Van Zant* is misplaced. Figure 7.28 of *Van Zant* does not show a wet oxidation (e.g., oxidation in with steam), but rather a dry oxidation (oxidation with O₂ only). This is clearly evident from the legend in the upper left corner of 30 Figure 7.28, which says "two-step dry O₂". Accordingly, the teachings of *Van Zant* relied upon

² *Clementi et al.*, Col. 5, Lines 31-33, emphasis added.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

by the rejection cannot show explicitly or inherently wet oxidation, as such teachings are directed to dry (i.e., O₂ only) oxidation.

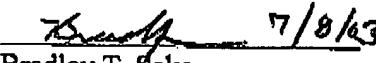
In summary, the rejection of claims 4 and 5 is improper as a rejection based on anticipation, and relies on a teaching not shown in the cited reference.

5 For all of these reasons, this ground of rejection is traversed.

Claims 1, 2, 4, 5, and 13 have been amended. The present claims 1-20 are believed to be in allowable form. It is respectfully requested that the application be forwarded for allowance and issue.

10

Respectfully Submitted,

 7/8/03

Bradley T. Sako
Attorney
Reg. No. 37,923

15

Bradley T. Sako
Attorney/Agent
300 South First Street
Suite 235
San Jose, CA 95113
Tel. 1-408-289-5315

20

Response to Office Action - Page 9 of 9